REPLY TO DETAILED ACTION DATED 11/4/2004

I respectfully disagree with the statement that my invention (Application/Control Number: 10/657,410) could be anticipated by Bowden et al (5,538,209) for the following reasons.

1. In direct rebuttal of the explanation for rejecting the Claims 1, 2, 3, and 6 in paragraph 2 of DETAILED ACTION only the first ten lines of text may be interpreted as describing but just a tiny portion of Bowden et al. The wording in first seven lines may be interpreted to refer to cables 14, 16 and pulleys 10, 12 ONLY since there are no cables or pulleys anywhere else. However, it is an error to suggest that this set of cables is "*connected to said pulley and to said control surface*"; it is not. Further wording in lines eight, nine, ten and first portion of line 11 - that supposedly explains the function of the "driving system" - must also be attributed again to the same cables 14, 16 ONLY since only these cables "*receive a control input*" and only these cables are "*causing said pulleys to rotate*". But it is an error to say that thus described "Bowden et al driving system" is such that " *if one of said pulleys experiences a resistance to rotation enables continuous operation of the other pulley by said control input*"; it is not. It is also an error to suggest that such a driving system is "*enabling said pulleys to rotate independently of said control input*"; it does not. The rest of the lines using portions of the text from Claims 2, 3 and 6 of my invention DOES NOT describe at all the Bowden et al, as explained in the following paragraphs. One can not pick and choose only certain words from a Claim and try to describe another art without considering the Claim as a whole. Therefore, DETAILED ACTION's alleged description of Bowden et al using only a portion of wording of Claims 1, 2, 3 and 6 of my invention is not justified.

Please note that elements identified bellow by the numbers in parentheses (xx) refer to my invention while the elements with numbers without parentheses refer to Bowden et al. Also note that the wording in *italic* are a direct quote from my invention.

2. Bowden et al does not have cables connected to control surfaces and does not claim to have them. My invention explicitly specifies that "...*a set of control cables operatively connected to said pulley and to said control surface* ...". See Figures 3 and 4.

3. Bowden et al specifies that the cables 14, 16 operate disk-like sectors 10, 12 from the controls at the cockpit (a pitch command). My invention specifies that a driving system (1,2,3,4) operates the pulleys (disk-like sectors) and NOT the cable segments that Bowden et al specifies.

4. In my invention the driving system (1,2,3,4) allows for continued operation of one side of the main control surface if the other offers a resistance, while Bowden et al does not do that but instead disconnects completely both main control surfaces from the pitch command via shutoff valve 76 - making them free to rotate - and connects the pitch command to a secondary control surface, the elevator control tab 84, which then indirectly controls - but to a very limited degree - the main elevator control surface. A control tab is a secondary surface located toward the trailing edge of the main control surface of which it is a small part. Effectiveness of a control tab in controlling the airplane pitch movement is severely reduced when compared to a full surface deflection which my invention provides. My invention also ensures a full recovery of controls if and when a resistance to the operation of one of the surfaces subsides (for instance when ice melts or breaks away), while Bowden et al does not provide for that recovery at all. Furthermore, my invention as described in Claim 1, calls for a driving system to provide for "... *pulleys to rotate independently of said control input when said pulleys receive forced feedback from unequal load between those two control surfaces*", while Bowden et al does not have that feature.

5. A comparison of the driving system in Claim 2 of my invention and particularly the bellcrank (2) to the transfer bar 74 of the Bowden et al is only figurative (see lines 12 thru 15 of § 2 of DETAILED ACTION). First of all, these two elements serve completely different functions. The bellcrank (2) of my invention connects directly to, and drive the pulleys that operate the primary control surfaces in both the normal operation and in a

failure mode, while in Bowden et al the transfer bar 74 does not connect to the disk-like sector (pulleys} at all but connects via push rod 70 to the motion sensor at 68 (see Figure 1) and its action does not impart any movement of said pulleys (disk-like sectors). Bellcrank (2) however, does "*impart a rotational movement of said pulleys*". Bellcrank (2} moves translationally and pivotally in normal operation while the transfer bar 74 does not translate at all, and does not move at all when the control system normally operates; it is only active (pivots only around either end) in a failure mode. Neither the design nor the function is the same in this comparison between bellcrank (2) and the transfer bar 74.

6. In reference to a spring or springs of Claim 3 of my invention and a comparison to a spring 80 of Bowden et al is also in error (see lines 16 thru 19 of § 2 of DETAILED ACTION). Spring 80 is part of the motion sensor 18, serves an important function without which the system would not work, and insures that cranks 20 and 64 of said motion sensor move together. Spring 80 is not "*installed between said bellcrank and said axially movable element" and does not "resist the pivotal movement of said bellcrank*" (the transfer bar 74). In contrast, the springs (13) and (13a) of my invention do constrain the pivoting of the bellcrank (2) and are only an optional feature that may or may not be utilized. They do not serve a primary function in controlling the aircraft and if utilized do not play any role in a normal operation of the controls since the bellcrank does not pivot then. These springs only act to resist the pivoting of the bellcrank in order to modify the threshold of the opposite movement of the left and right control surfaces (and the two pulleys) relative to each other by increasing the natural frequency of the entire control system.

7. Every flight control system of every aircraft consists of some system of cables, pulleys, springs, links and bellcranks so they by themselves do not constitute an innovation neither in Bowden et al nor in my invention. Therefore, if a portion of one single Claim resembles an existing design, the whole Claim should not be rejected because of that, but that portion must be judged in combination with other portions of the same Claim when considering the inventiveness. Otherwise, portions a), b) and c) of Bowden's et al Claim 1, that describe many control systems in prior existence, would have caused the whole

Claim to be rejected also but it was not. Any one Claim of a proposed innovation must be considered in its entirety in order to evaluate it against an existing art.

Claim 1 of my invention when considered in its entirety does not describe and does not resemble Bowden et al. More proper description of Bowden et al system would be a hydraulic control system AND NOT "*a cable control system*". In Bowden et al: a) control cables ARE NOT "*connected to said pulleys and to said control surfaces*", they are connected to disk-like sectors and cockpit controls; b) disk-like sectors 10,12 DO NOT have independent movement, they always rotate an equal amount as stated in Claim 1.b); c) disk-like sectors NEVER "*experience a resistance to rotation*" in order to go to a failure mode but rather "movement in the mechanical linkage 24 that is inconsistent with the command input motion (angular displacement of sector 10)" detects a failure mode (see description of Fig. 3b); d) one of disk-like sectors is NEVER ABLE of "*continuous and uninterrupted operation*" when the other is constrained, they both always move in unison; e) Bowden et al system DOES NOT ALLOW rotation of "*said control surfaces in opposition of each other, independent of the control input, when said pulleys receive a forced feedback from unequal load between those two control surfaces*"; if this feedback does occur in the Bowden et al system it may perhaps only disconnect the primary control surfaces from the cockpit controls and go to a failure mode, with no possibility of returning to the normal operation.

Claim 2 of my invention when considered in its entirety does not describe and does not resemble Bowden et al. In Bowden et al the transfer bar 74 is not connected by rod to a pulley as is the bellcrank (2) in my invention (rod 70 connects to crank 64). Bellcrank (2) of my invention is connected "*so that either translational or pivotal movement of said bellcrank imparts a rotational movement of said pulleys*". In fact, the Bowden et al transfer bar 74 does not move translationally at all and does not impart any movement to said pulleys even when it pivots. I believe the reference to "see abstract" in DETAILED ACTION" is misunderstood. The abstract mentions a pair of cranks 20, 64 that are a part of the motion sensor and have nothing to do with operating the pulleys.

Claim 3 of my invention when considered in its entirety does not describe and does not resemble Bowden et al. In Bowden et al the spring 80 IS NOT "*installed between said bellcrank and said axially movable element to resist the pivotal movement of said bellcrank relative to said axially movable element*"; rather the spring 80 is installed within the motion sensor 18 to keep the two cranks 20 and 64 together by a predetermined spring preload (see Abstract) and has nothing to do with pivoting of the transfer bar 74, aka bellcrank.

Claim 6 of my invention when considered in its entirety does not describe and does not resemble Bowden et al. In Bowden et al the spring 80 is of a predetermined preload and DOES NOT possess any "*spring preload adjustment mechanism*"; and furthermore, spring 80 IS NOT connected in any way to the bellcrank (the transfer bar 74) to resist the pivotal movement of it.

8. Finally, my invention is not only innovative but is also so much simpler - containing common elements only, provides for an easy retrofit to existing aircraft, provides safer operation of an aircraft in case of a failure, and is so much less expensive to build and operate then any other patented system, thus having a great economic impact on the aircraft industry as a whole - so that that by itself deserves granting a patent.

9. For all the reasons cited above I pray that the examiner, Mr. Stephen A. Holzen, reconsiders the rejection of Claims 1, 2, 3 and 6 and allows them to stand as proposed in the Application. Furthermore, since the Claim 1 is of generic type, to also allow Claims 4 and 5 to be included to stand as well. Thank you.

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